PATENT COOPERATION TREATY

From the INTERNATIONAL BUREAU

PCT

NOTIFICATION OF ELECTION

(PCT Rule 61.2)

To:

Commissioner
US Department of Commerce
United States Patent and Trademark
Office, PCT
2011 South Clark Place Room
CP2/5C24
Arlington, VA 22202
ETATS-UNIS D'AMERIQUE

in its capacity as elected Office

Date of mailing (day/month/year) 23 February 2001 (23.02.01)	
International application No. PCT/FI00/00543	**Applicant's or agent's file reference** 6046PCTS
International filing date (day/month/year) 16 June 2000 (16.06.00)	**Priority date** (day/month/year) 30 June 1999 (30.06.99)
Applicant LUUSUA, Jarmo et al	

1. The designated Office is hereby notified of its election made:

[X] in the demand filed with the International Preliminary Examining Authority on:

11 January 2001 (11.01.01)

[ ] in a notice effecting later election filed with the International Bureau on:

2. The election [X] was

[ ] was not

made before the expiration of 19 months from the priority date or, where Rule 32 applies, within the time limit under Rule 32.2(b).

The International Bureau of WIPO **34, chemin des Colombettes** **1211 Geneva 20, Switzerland**	Authorized officer R. E. Stoffel
Facsimile No.: (41-22) 740.14.35	Telephone No.: (41-22) 338.83.38

Form PCT/IB/331 (July 1992)

FI0000543

PATENT COOPERATION TREATY

PCT

REC'D 10 OCT 2001
WIPO PCT

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference 6046PC TS	FOR FURTHER ACTION	See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)
International application No. PCT/FI00/00543	International filing date *(day/month/year)* 16.06.2000	Priority date *(day/month/year)* 30.06.1999
International Patent Classification (IPC) or national classification and IPC 7 A61B 6/00, B62D 1/12		
Applicant Instrumentarium Corporation et al		

1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.

2. This REPORT consists of a total of 6 sheets, including this cover sheet.

   ☒ This report is also accompanied by ANNEXES, i.e., sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).

   These annexes consist of a total of 1 sheets.

3. This report contains indications relating to the following items:

   - I ☒ Basis of the report
   - II ☐ Priority
   - III ☒ Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
   - IV ☒ Lack of unity of invention
   - V ☒ Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
   - VI ☐ Certain documents cited
   - VII ☐ Certain defects in the international application
   - VIII ☐ Certain observations on the international application

Date of submission of the demand	Date of completion of this report
11.01.2001	[illegible].09.2001
Name and mailing address of the IPEA/SE Facsimile No. [illegible]	Authorized officer [illegible] /OGU Telephone No. [illegible]

Form PCT/IPEA/409 (cover sheet) (January 1998)

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No.
PCT/FI00/00543

I. Basis of the report

1. With regard to the **elements** of the international application:*

- [ ] the international application as originally filed
- [x] the description:
  - pages 1-3 , as originally filed
  - pages , filed with the demand
  - pages , filed with the letter of
- [x] the claims:
  - pages 4 , as originally filed
  - pages , as amended (together with any statement) under article 19
  - pages , filed with the demand
  - pages 5 , filed with the letter of 10.09.2001
- [ ] the drawings:
  - pages 1 , as originally filed
  - pages , filed with the demand
  - pages , filed with the letter of
- [ ] the sequence listing part of the description:
  - pages , as originally filed
  - pages , filed with the demand
  - pages , filed with the letter of

2. With regard to the **language**, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.
These elements were available or furnished to this Authority in the following language English which is:

- [ ] the language of a translation furnished for the purposes of international search (under Rule 23.1(b)).
- [x] the language of publication of the international application (under Rule 48.3(b)).
- [ ] the language of the translation furnished for the purposes of international preliminary examination (under Rules 55.2 and/or 55.3).

3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

- [ ] contained in the international application in written form.
- [ ] filed together with the international application in computer readable form.
- [ ] furnished subsequently to this Authority in written form.
- [ ] furnished subsequently to this Authority in computer readable form.
- [ ] The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
- [ ] The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. [ ] The amendments have resulted in the cancellation of:
   - [ ] the description, pages
   - [ ] the claims, Nos.
   - [ ] the drawings, sheet/fig

5. [ ] This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).**

* *Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are annexed to this report since they do not contain amendments (Rules 70.16 and 70.17).*

** *Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.*

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No
PCT/FI00/00543

III. Non-establishment of opinion with regard to novelty, inventive step and industrial applicability

1. The questions whether the claimed invention appears to be novel, to involve an inventive step (to be non obvious), or to be industrially applicable have not been examined in respect of

☐ the entire international application.

☒ claims Nos. 5

because:

☐ the said international application, or the said claims Nos. _____
relate to the following subject matter which does not require an international preliminary examination *(specify)*:

☐ the description, claims or drawings *(indicate particular elements below)* or said claims Nos. _____
are so unclear that no meaningful opinion could be formed *(specify)*:

☐ the claims, or said claims Nos. _____ are so inadequately supported
by the description that no meaningful opinion could be formed.

☒ no international search report has been established for said claims Nos. 5

2. A meaningful international preliminary examination cannot be carried out due to the failure of the nucleotide and/or amino acid sequence listing to comply with the standard provided for in Annex C of the Administrative Instructions:

☐ the written form has not been furnished or does not comply with the standard.

☐ the computer readable form has not been furnished or does not comply with the standard.

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No.
PCT/FI00/00543

IV. Lack of unity of invention

1 In response to the invitation to restrict or pay additional fees the applicant has

- ☐ restricted the claims.
- ☐ paid additional fees.
- ☐ paid additional fees under protest.
- ☐ neither restricted nor paid additional fees.

2. ☒ This Authority found that the requirement of unity of invention is not complied with and chose, according to Rule 68.1, not to invite the applicant to restrict or pay additional fees.

3 This Authority considers that the requirement of unity of invention in accordance with rules 13.1, 13.2 and 13.3 is

- ☐ complied with
- ☒ not complied with for the following reasons:

The application relates to two inventions, which lacks common special technical features:

1. The mobile X-ray apparatus according to claims 1-4 with the special technical feature that the handle is constructed as a crossbar extending between two sidebars.
2. The mobile X-ray apparatus according to claim 5 with the special technical feature that the apparatus is equipped with release means.

4 Consequently, the following parts of the international application were the subject of international preliminary examination in establishing this report:

- ☐ all parts.
- ☒ the parts relating to claims Nos. 1 – 4

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No.
PCT/FI00/00543

V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Claims	1-4	YES
	Claims		NO
Inventive step (IS)	Claims	1-4	YES
	Claims		NO
Industrial applicability (IA)	Claims	1-4	YES
	Claims		NO

2. Citations and explanations (Rule 70.7)

In the International Search Report the following document of particular relevance is cited:

D1: US 5351282 A

Document D1 describes a mobile X-ray apparatus with a carriage with one pair of independently driving wheels (refer to abstract and figure 2) and their motor means (refer to figure 5). The carriage includes driving handles (12R and 12L), which comprise sidebars. The apparatus includes means (14a and 14b) responsive to the movement of the driving handles, the responsive means control the operation of the motor means in order to steer the carriage in the desired direction. The sidebars of the driving handles are attached to a rotation axis solidly fixed to the carriage, so as to turn about the axis. The side bars are provided with means (26) which moves along with the turning movement of the respective side bar (22R) and the movement is measured by measuring means (24a and 24b), (refer to figure 8). The measuring means convert the movement of the said means into an electric signal by means of which the operation of the motor means of the driving wheels is controlled (refer to column 4, line 15 - column 5, line 20). The apparatus comprises means for positioning the driving handles in their centre position when the grips of the driving handles are released (refer to column 2, line 63 - column 3, line 9).

The invention according to claim 1-4 differs from what is described in D1 in that the sidebars are connected to a crossbar in an articulated manner. The sidebars are hence in connection with each other through the crossbar. This enables the sidebars to be turned about the rotation axis in different directions. This difference solves the problem of steering the carriage with one hand. This is not possible with the carriage

.../...

Supplemental Box
(To be used when the space in any of the preceding boxes is not sufficient)

Continuation of: Box V.

described in D1. It is not considered to be obvious for a person skilled in the art to construct a mobile X-ray apparatus with an articulated handle, as described in the international application, by studying document D1. Hence, what is claimed in claims 1-4 is novel and is considered to involve an inventive step. The invention according to claims 1-4 is also considered to be industrially applicable.

5. A mobile X-ray apparatus which comprises a carriage provided with at least one pair of independently driven driving wheels and their motor means (12), the carriage including a driving handle, the said apparatus in addition comprising means responsive to the movement of the driving handle, which responsive means control the operation of the motor means (12) in order to steer the carriage in the desired direction, **characterised** in that the apparatus further comprises release means (7-9) by which the motor means (12) can be released from the driving coupling with the driving wheels (17), allowing the wheels (17) to rotate freely and thus the manual transfer of the carriage, and having means to cause braking of the carriage when the carriage is transferred manually.

INTERNATIONAL SEARCH REPORT

International application No.
PCT/FI 00/00543

A. CLASSIFICATION OF SUBJECT MATTER

IPC7: A61B 6/00, B62D 1/12
According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC7: A61B, B62B, B62D

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

SE,DK,FI,NO classes as above

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 5351282 A (T. KADOWAKI ET AL.), 27 Sept 1994 (27.09.94), column 1, line 57 - column 3, line 9; column 5, line 20 - line 56, figures 5-8, abstract --	1-4
D,A	US 4697661 A (MICHAEL J. PAJERSKI ET AL), 6 October 1987 (06.10.87), abstract --	1-4
A	US 4341279 A (HANS WAERVE), 27 July 1982 (27.07.82), column 1, line 27 - line 58, figures 1-2 -- --------	1-4

☐ Further documents are listed in the continuation of Box C. ☒ See patent family annex.

* Special categories of cited documents:
"A" document defining the general state of the art which is not considered to be of particular relevance
"E" erlier document but published on or after the international filing date
"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
"O" document referring to an oral disclosure, use, exhibition or other means
"P" document published prior to the international filing date but later than the priority date claimed
"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
"X" document of particular relevance: the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
"Y" document of particular relevance: the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
25 October 2000	01 -11- 2000
Name and mailing address of the ISA: Swedish Patent Office Box 5055, S-102 42 STOCKHOLM Facsimile No. + 46 8 666 02 86	Authorized officer Cilla Lyckman/MN Telephone No. + 46 8 782 25 00

INTERNATIONAL SEARCH REPORT

Information on patent family members

03/10/00

International application No.
PCT/FI 00/00543

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 5351282 A	27/09/94	JP 1986177 C	08/11/95
		JP 6095074 B	24/11/94
		JP 6194314 A	15/07/94
		JP 2671709 B	29/10/97
		JP 5277095 A	26/10/93
US 4697661 A	06/10/87	DE 3784794 D,T	21/10/93
		DK 366387 A	15/01/88
		EP 0253333 A,B	20/01/88
		SE 0253333 T3	
		JP 1928464 C	12/05/95
		JP 4066577 B	23/10/92
		JP 63021038 A	28/01/88
US 4341279 A	27/07/82	DE 7730536 U	15/03/79
		FR 2404989 A,B	27/04/79

(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property Organization
International Bureau

(43) International Publication Date
11 January 2001 (11.01.2001)

PCT

(10) International Publication Number
WO 01/01860 A1

(51) International Patent Classification⁷: A61B 6/00, B62D 1/12

(21) International Application Number: PCT/FI00/00543

(22) International Filing Date: 16 June 2000 (16.06.2000)

(25) Filing Language: Finnish

(26) Publication Language: English

(30) Priority Data:
991487 30 June 1999 (30.06.1999) FI

(71) Applicant *(for all designated States except US)*: **INSTRUMENTARIUM CORPORATION** [FI/FI]; Nahkelantie 160, FIN-04301 Tuusula (FI).

(72) Inventors; and
(75) Inventors/Applicants *(for US only)*: **LUUSUA, Jarmo** [FI/FI]; Simonkalliontie 10 A 3, FIN-01300 Vantaa (FI). **POHJOISPURO, Petri** [FI/FI]; Kukinkuja 10 F 89, FIN-01620 Vantaa (FI). **PYRRÖ, Petri** [FI/FI]; Knaapilantie 5 A, FIN-04330 Lahela (FI).

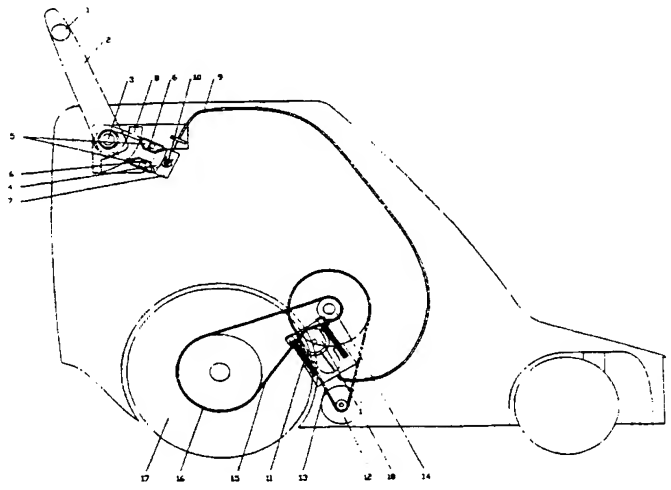
(74) Agent: **LEITZINGER OY**; Ruoholahdenkatu 8, FIN-00180 Helsinki (FI).

(81) Designated States *(national)*: DE, DE (utility model), JP, US.

Published:
With international search report
-- *Before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments.*

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

(54) Title: STEERING ARRANGEMENT FOR MOBILE X-RAY APPARATUS



(57) Abstract: The invention relates to a mobile X-ray apparatus that comprises a carriage provided with at least one pair of independently driven driving wheels and their motor means (12). The carriage includes a driving handle, which comprises sidebars (2), attached to a rotation axis solidly fixed to the carriage, and a crossbar (1), which is connected to the sidebars in an articulated manner to allow the turning movement of the sidebars about the said axis independently of each other. The apparatus also comprises means for controlling the operation of the motor means by movements of the handle. The sidebars are provided with means (4) that move along with the movement of the respective sidebar (2). The movements are measured by measuring means (10), which convert the movement into an electric signal by means of which the motor means (12) of the driving wheels (17) are controlled.

WO 01/01860 A1

RECORD COPY

PCT REQUEST

6046PCTS

Original (for **SUBMISSION**) - printed on 16.06.2000 11:49:01 AM

0	**For receiving Office use only**	
0-1	International Application No.	PCT/FI 0 0 / 0 0 5 4 3
0-2	International Filing Date	16 JUN 2000 (16 -06- 2000)
0-3	Name of receiving Office and "PCT International Application"	The Finnish Patent Office PCT International Application
0-4	**Form - PCT/RO/101 PCT Request**	
0-4-1	Prepared using	PCT-EASY Version 2.90 (updated 08.03.2000)
0-5	**Petition** The undersigned requests that the present international application be processed according to the Patent Cooperation Treaty	
0-6	**Receiving Office (specified by the applicant)**	National Board of Patents and Registration (Finland) (RO/FI)
0-7	**Applicant's or agent's file reference**	6046PCTS
I	**Title of invention**	MOBILE X-RAY APPARATUS
II	**Applicant**	
II-1	This person is:	applicant only
II-2	Applicant for	all designated States except US
II-4	Name	INSTRUMENTARIUM CORPORATION
II-5	Address:	Nahkelantie 160 FIN-04301 Tuusula Finland
II-6	State of nationality	FI
II-7	State of residence	FI
II-8	Telephone No.	358-9-258 851
II-9	Facsimile No.	358-9-275 7276
II-10	e-mail	www.instrumentarium.fi/imaging
III-1	**Applicant and/or inventor**	
III-1-1	This person is:	applicant and inventor
III-1-2	Applicant for	US only
III-1-4	Name (LAST, First)	LUUSUA, Jarmo
III-1-5	Address:	Simonkalliontie 10 A 3 FIN-01300 Vantaa Finland
III-1-6	State of nationality	FI
III-1-7	State of residence	FI

PCT REQUEST 6046PCTS

Original (for **SUBMISSION**) - printed on 16.06.2000 11:49:01 AM

III-2	**Applicant and/or inventor**	
III-2-1	This person is:	applicant and inventor
III-2-2	Applicant for	US only
III-2-4	Name (LAST, First)	POHJOISPURO, Petri
III-2-5	Address:	Kukinkuja 10 F 89 FIN-01620 Vantaa Finland
III-2-6	State of nationality	FI
III-2-7	State of residence	FI
III-3	**Applicant and/or inventor**	
III-3-1	This person is:	applicant and inventor
III-3-2	Applicant for	US only
III-3-4	Name (LAST, First)	PYRRÖ, Petri
III-3-5	Address:	Knaapilantie 5 A FIN-04330 Lahela Finland
III-3-6	State of nationality	FI
III-3-7	State of residence	FI
IV-1	**Agent or common representative; or address for correspondence** The person identified below is hereby/has been appointed to act on behalf of the applicant(s) before the competent International Authorities as:	agent
IV-1-1	Name	LEITZINGER OY
IV-1-2	Address:	Ruoholahdenkatu 8 FIN-00180 Helsinki Finland
IV-1-3	Telephone No.	+358-9-6859920
IV-1-4	Facsimile No.	+358-9-68599210
IV-1-5	e-mail	palei@leitzinger.fi
V	**Designation of States**	
V-1	Regional Patent (other kinds of protection or treatment, if any, are specified between parentheses after the designation(s) concerned)	--
V-2	National Patent (other kinds of protection or treatment, if any, are specified between parentheses after the designation(s) concerned)	DE (patent and utility model) JP US
V-5	**Precautionary Designation Statement** In addition to the designations made under items V-1, V-2 and V-3, the applicant also makes under Rule 4.9(b) all designations which would be permitted under the PCT except any designation(s) of the State(s) indicated under item V-6 below. The applicant declares that those additional designations are subject to confirmation and that any designation which is not confirmed before the expiration of 15 months from the priority date is to be regarded as withdrawn by the applicant at the expiration of that time limit.	
V-6	**Exclusion(s) from precautionary designations**	NONE

PCT REQUEST

Original (for **SUBMISSION**) - printed on 16.06.2000 11:49:01 AM

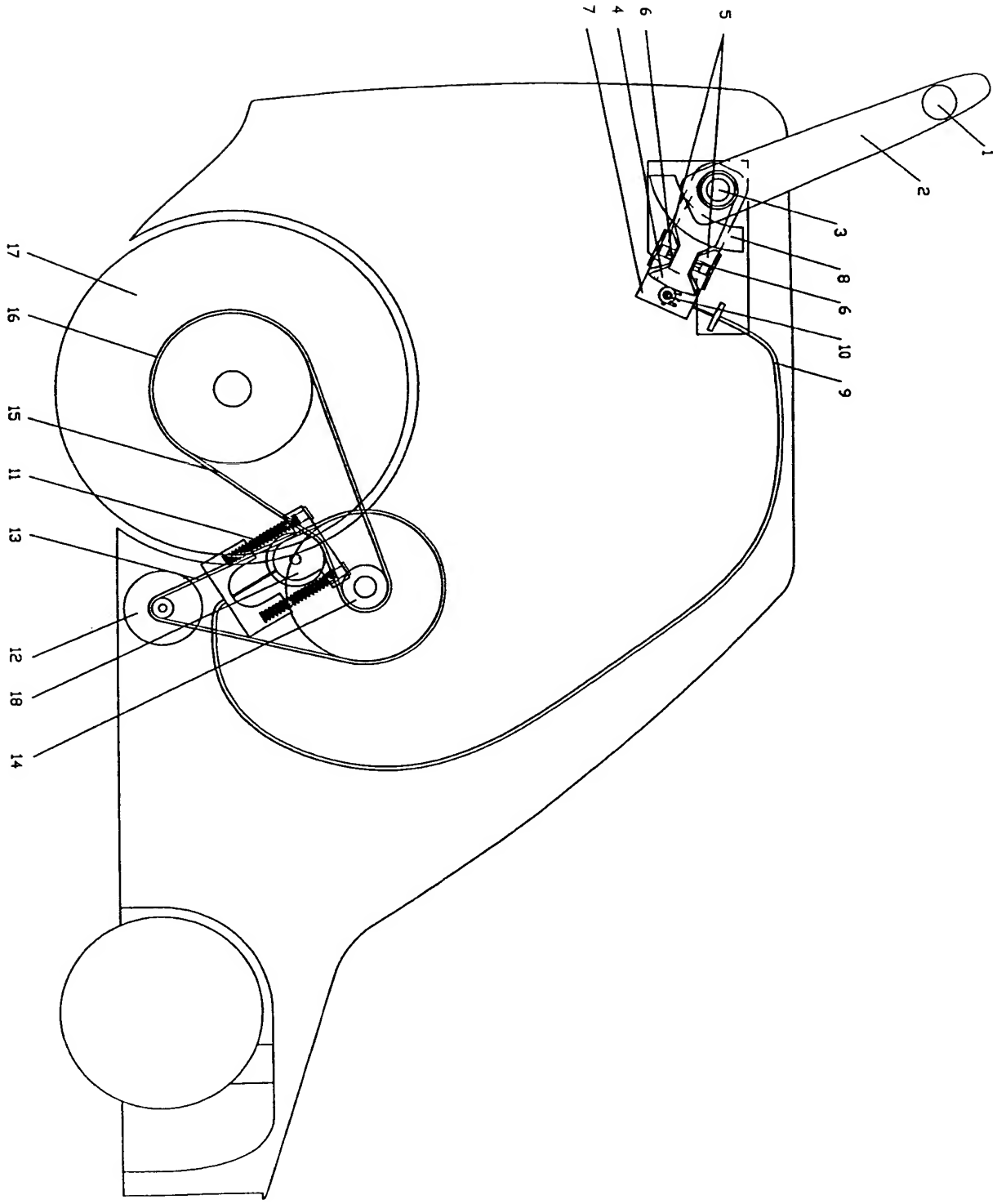
VI-1	**Priority claim of earlier national application**		
VI-1-1	Filing date	30 June 1999 (30.06.1999)	
VI-1-2	Number	991487	
VI-1-3	Country	FI	
VI-2	**Priority document request** The receiving Office is requested to prepare and transmit to the International Bureau a certified copy of the earlier application(s) identified above as item(s):	VI-1	
VII-1	**International Searching Authority Chosen**	Swedish Patent Office (ISA/SE)	
VIII	**Check list**	number of sheets	electronic file(s) attached
VIII-1	Request	3	-
VIII-2	Description	3	-
VIII-3	Claims	1	-
VIII-4	Abstract	1	abst.txt
VIII-5	Drawings	1	-
VIII-7	TOTAL	9	
	Accompanying items	paper document(s) attached	electronic file(s) attached
VIII-8	Fee calculation sheet	✓	-
VIII-16	PCT-EASY diskette	-	diskette
VIII-18	**Figure of the drawings which should accompany the abstract**	1	
VIII-19	**Language of filing of the international application**	Finnish	
IX-1	**Signature of applicant or agent**	Timo Sole	
IX-1-1	Name	LEITZINGER OY	
IX-1-2	Name of signatory	Timo Sole	

FOR RECEIVING OFFICE USE ONLY

10-1	**Date of actual receipt of the purported international application**	16 JUN 2000	(16-06-)
10-2	**Drawings:**		
10-2-1	Received		
10-2-2	Not received		
10-3	**Corrected date of actual receipt due to later but timely received papers or drawings completing the purported international application**		
10-4	**Date of timely receipt of the required corrections under PCT Article 11(2)**		
10-5	**International Searching Authority**	ISA/SE	
10-6	**Transmittal of search copy delayed until search fee is paid**		

FOR INTERNATIONAL BUREAU USE ONLY

11-1	**Date of receipt of the record copy by the International Bureau**	07 JULY 2000	(07.07.00)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Liikuteltava röntgenlaite

Esillä olevan keksinnön kohteena on liikuteltava röntgenlaite, johon kuuluu ainakin yhdellä itsenäisesti käytettyjen vetopyörien parilla ja niiden moottorielimillä varustettu vaunu, jossa on ajokahva, johon kuuluu sivutangot ja niiden välillä ulottuva poikittaistanko, jossa laitteessa on lisäksi ajokahvan liikkeeseen reagoivat elimet, jotka ohjaavat moottorielimien toimintaa vaunun ohjaamiseksi haluttuun suuntaan.

Liikuteltavaan röntgenlaitteeseen kuuluu vaunu, johon on liitetty röntgensäteen lähde, röntgensäteen vastaanottoelimet ja tarvittava ohjauselektroniikka ja mahdollisesti monitori esimerkiksi digitaalisesti tuotettujen röntgenkuvien tarkastelemiseksi välittömästi. Käytettäessä liikkuvassa röntgenlaitteessa akkuja tehonlähteenä kasvaa laitteen paino ja se voi olla esimerkiksi suuruusluokkaa noin 300 kg, jolloin laitteen kevyempi liikuteltavuus edellyttää ajoliikkeen motorisointia. Eräs tapa tällaisen motorisoidun röntgenlaitteen ohjaamiseksi on järjestää ajokahva, jonka manuaalinen liikuttaminen aikaansaa ohjaussignaalien syntymisen vaunun vetopyörien moottorielimien käyttämiseksi vaunun ohjaamiseksi haluttuun suuntaan. Eräs tällainen ratkaisu on esitetty US patentissa 4697661, jossa ajokahvan toiminta perustuu ajokahvan liikkeen muuttamisen ajokahvan läheisyyteen järjestettyjen ulokevarsien taivutusliikkeeksi, joka taivutusliike aikaansaa mainittujen ohjaussignaalien muodostumisen. Esillä olevan keksinnön eräänä päämääränä on aikaansaada uudentyyppinen liikuteltava röntgenlaite, jossa ajokahvan liike on muutettavissa suhteellisen yksinkertaisesti ja luotettavasti moottorielimien ohjauselektroniikkaa ohjaavaksi sähkösignaaliksi. Eräänä tärkeänä lisätavoitteena on aikaansaada moottoroitu liikuteltava röntgenlaite, joka on lisäksi järjestetty liikuteltavaksi poikkeustilanteessa pelkästään manuaalisesti ilman moottorielimiä.

Keksinnön päämäärien toteuttamiseksi keksinnön mukaiselle liikuteltavalle röntgenlaitteelle on tunnusomaista se, että ajokahvan sivutangot on kiinnitetty vaunuun kiinteästi liitetylle kiertoakselille sen ympäri kääntyväksi; että sivutangot ja poikittaistanko on liitetty toisiinsa nivelöidysti sallimaan sivutankojen eri

suuruisen ja/tai erisuuntaisen kääntöliikkeen mainitun kiertoakselin ympäri; että sivutangot on varustettu elimillä, jotka liikkuvat kulloinkin siihen liittyvän sivutangon kääntöliikkeen mukana ja joiden elimien liike mitataan mittauselimillä, jotka muuttavat mainittujen elimien liikkeen sähkösignaaliksi, jolla ohjataan vetopyörien moottorielimien toimintaa.

Seuraavassa keksintöä selostetaan yksityiskohtaisemmin oheiseen piirustukseen viitaten, jonka ainoa kuvio esittää kaaviollisena sivusta nähtynä kuvantona röntgenlaitteen vaunuosaa ilman siihen liitettäviä varsinaisia röntgenkuvauksen laitteita.

Kuvion mukaisesti vaunuun kuuluu vetopyörät 17, joita on esitetyssä suoritusmuodossa yksi vaunun kummallakin sivulla, ja joita kulloinkin käytetään ajomoottorilla 12 hihnojen 13, 15 välityksellä. Hihnaa 15 kiristetään kiristysjousien 11 ja niihin liitetyn kiristyspyörän 18 avulla ajomoottorin 12 pyörimisliikkeen siirtämiseksi hihnapyörien 14,16 kautta vetopyörälle 17. Ajomoottorin 12 toimintaa ohjataan ajokahvalla, johon kuuluu sivutangot 2, ja niiden väliin nivelöidysti liitetty poikittaistanko 1. Sivutangot 2 on kiinnitetty vaunuun kiinteästi liitetylle kiertoakselille 3 mahdollistamaan niiden kääntöliikkeen kiertoakselin 3 ympäri. Sivutankojen kiertoakselin 3 puoleiseen päähän on liitetty esitetyssä suoritusmuodossa hammaskehän osa 4, joka liikkuu kääntöliikkeessä sivutangon 2 mukana. Tämä hammaskehän 4 kääntöliike mitataan esimerkiksi potentiometrinä toteutetulla mittauselimellä 10, joka muuttaa mainitun liikkeen sähkösignaaliksi, joka syötetään ajomoottoreiden 12 ohjauselektroniikalle ajomoottoreiden käyttämiseksi vaunun ohjaamiseksi haluttuun suuntaan. Sivutankojen 2 ja poikittaistangon 1 välinen nivelliitos sallii sivutankojen 2 eri suuruisen ja tarvittaessa eri suuntaisen kääntöliikkeen kiertoakselin 3 ympäri halutun kulkusuunnan mahdollistamiseksi. Ajettaessa suoraan (eteen- tai taaksepäin) vetopyörät pyörivät keskenään samalla nopeudella ja samaan suuntaan mutta käännyttäessä vasemmalle tai oikealle on toisen vetopyörän pyörittävä hitaammin kuin toisella puolella oleva vetopyörä tai vetopyörien on pyörittävä eri suuntiin.

Poikkeustilanteen varalta, esimerkiksi virran ollessa kytkemättä laitteeseen tai akkujen ollessa tyhjät, on keksinnön mukaiseen röntgenlaitteen vaunuun järjestetty elimet, joilla ajomoottorit 12 voidaan vapauttaa vedosta vetopyörien 17 kanssa sallimaan laitteen manuaalinen siirtäminen. Esitetyssä suoritusmuodossa näihin elimiin kuuluu vapautuslevy 7, johon on liitetty vaijeri 9, joka on liitetty vetohihnan 15 kiristyspyörään 18. Vedettäessä tai työnnettäessä ajokahvaa voimakkaasti yli normaalin ajoliikkeen vapautuslevy 7 vetää vaijeria 9, joka puolestaan vetää kiristyspyörää 18 päästäen vetohihnan 15 luistamaan hihnapyörän 14 yli. Tällöin työnnettäessä tai vedettäessä vaunua pyörät 17 pääsevät pyörimään vaikka ajomoottori 12 on itsepitävä. Vapautettaessa ajokahvasta kiristysjouset 11 painavat kiristyspyörää 18 vetohihnaa 15 vasten, jolloin ajokahvan vapautus toimii jarruna itsepitävän ajomoottorin johdosta. Vedettäessä ajokahva normaaliasentoon se lukkiutuu siihen. Ajokahvan normaali ajoliike on rajoitettu liikerajoittimilla 5 ja vapautuselimien liike on puolestaan rajoitettu rajoitinlevyllä 8. Hammaskehän 4 yhteyteen on lisäksi järjestetty edullisesti jousielimet 6, jotka paikoittavat ajokahvan keskiasentoonsa vapautettaessa ote ajokahvasta. Ajokahvan korkeus on edullisesti järjestetty säädettäväksi.

Patenttivaatimukset

1. Liikuteltava röntgenlaite, johon kuuluu ainakin yhdellä itsenäisesti käytettyjen vetopyörien parilla ja niiden moottorielimillä (12) varustettu vaunu, jossa on ajokahva, johon kuuluu sivutangot (2) ja niiden välillä ulottuva poikittaistanko (1), jossa laitteessa on lisäksi ajokahvan liikkeeseen reagoivat elimet, jotka ohjaavat moottorielimien (12) toimintaa vaunun ohjaamiseksi haluttuun suuntaan, **tunnettu** siitä, että ajokahvan (1,2) sivutangot (2) on kiinnitetty vaunuun kiinteästi liitetylle kiertoakselille (3) sen ympäri kääntyväksi; että sivutangot (2) ja poikittaistanko (1) on liitetty toisiinsa nivelöidysti sallimaan sivutankojen (2) eri suuruisen ja/tai erisuuntaisen kääntöliikkeen mainitun kiertoakselin ympäri; että sivutangot on varustettu elimillä (4), jotka liikkuvat kulloinkin siihen liittyvän sivutangon (2) kääntöliikkeen mukana ja joiden elimien liike mitataan mittauselimillä (10), jotka muuttavat mainittujen elimien (4) liikkeen sähkösignaaliksi, jolla ohjataan vetopyörien (17) moottorielimien (12) toimintaa.

2. Patenttivaatimuksen 1 mukainen röntgenlaite, **tunnettu** siitä, että laitteeseen kuuluu elimet (6) ajokahvan (1,2) paikoittamiseksi automaattisesti keskiasentoonsa irrotettaessa ote ajokahvasta.

3. Patenttivaatimuksen 1 tai 2 mukainen röntgenlaite, **tunnettu** siitä, että ajokahvan (1,2) korkeus on säädettävissä.

4. Jonkin edellä olevan vaatimuksen mukainen röntgenlaite, **tunnettu** siitä, että laitteeseen kuuluu lisäksi vapautuselimet (7-9), joilla moottorielimet (12) ovat irrotettavissa vetokytkennästä vetopyörien (17) kanssa sallien pyörien (17) pyörimisen vapaasti ja siten vaunun siirtämisen manuaalisesti.

(57) Tiivistelmä

Keksinnön kohteena on liikuteltava röntgenlaite, johon kuuluu ainakin yhdellä itsenäisesti käytettyjen vetopyörien parilla ja niiden moottorielimillä (12) varustettu vaunu, jossa on ajokahva, johon kuuluu sivutangot (2) ja niiden välillä ulottuva poikittaistanko (1). Laitteessa on lisäksi ajokahvan liikkeeseen reagoivat elimet, jotka ohjaavat moottorielimien (12) toimintaa vaunun ohjaamiseksi haluttuun suuntaan. Keksinnön mukaisessa laitteessa on ajokahvan (1,2) sivutangot (2) on kiinnitetty vaunuun kiinteästi liitetylle kiertoakselille (3) sen ympäri kääntyväksi ja sivutangot (2) ja poikittaistanko (1) on liitetty toisiinsa nivelöidysti sallimaan sivutankojen (2) eri suuruisen ja/tai erisuuntaisen kääntöliikkeen mainitun kiertoakselin ympäri. Sivutangot on lisäksi varustettu elimillä (4), jotka liikkuvat kulloinkin siihen liittyvän sivutangon (2) kääntöliikkeen mukana ja joiden elimien liike mitataan mittauselimillä (10), jotka muuttavat mainittujen elimien (4) liikkeen sähkösignaaliksi, jolla ohjataan vetopyörien (17) moottorielimien (12) toimintaa.